CLAIMS

What is claimed is:

1. An electrical press device with an electric motor (2), a step-up gear (8), a spindle drive (66) in the form of a satellite roller screw, the thread spindle (14) of which is connected to the step-up gear (8) and the threaded nut (16) of which is guided in a cylindrical housing (22) in a non-rotatable manner, and such that it can be axially displaced, and is connected to a pressing tool, for converting a rotary motion of the electric motor (2) into a linear motion of the pressing tool, a travel sensor (30) for determining the distance traveled by the pressing tool, and a sensor (10) for determining the pressing force of the pressing tool, characterised in that the thread spindle (14) is mounted in the housing (22) by means of a pre-loaded set of angular contact ball bearings (12), the first angular contact ball bearing(s) (46) of which is (are) suitable for supporting traction forces and the second angular contact ball bearing(s) (48) of which is (are) suitable for supporting pressing forces, the inner rings of the angular contact ball bearings being contiguously clamped by a lock nut (52) against a shaft shoulder (54) of the thread spindle (14), and the outer rings of the angular contact ball bearing (46, 48) being contiguously clamped against a housing shoulder (58) by a housing nut (56), so that substantially equally great traction or pressing forces can be supported without any axial play.

2. The press device as claimed in claim 1, characterised in that the set of angular contact ball bearings (12) has two first (46) and two second angular contact ball bearing (48).

3. The press device as claimed in either of claims 1 or 2, characterised in that the step-up gear (8) is designed as a multi-stage transmission.

4. The press device as claimed in any of the preceding claims, characterised in that the step-up gear (8) has a transmission ratio of, for example, i=5.

5. The press device as claimed in any of the preceding claims, characterised in that the electric motor (2) is controlled electrically and has an angle encoder (30) on the motor shaft (4), a means (32) being present to determine the path traveled by the pressing tool by reference to the angle signals of the angle encoder (30), the transmission ratio of the step-up gear (8) and the thread pitch of the spindle drive (66).

6. The press device as claimed in any of the preceding claims, characterised in that a torque sensor (10) is disposed between an output shaft (36) of the step-up gear (8) and the thread spindle (14).

7. The press device as claimed in claim 6, characterised in that the torque sensor (10) has a transmitter for transmitting measured values contact-free.

8. The press device as claimed in either of claims 6 or 7, characterised in that the torque sensor (10) is easily accessible and exchangeable in order for it to be adapted to different pressing forces.

9. The press device as claimed in any of claims 6 to 8, characterised in that a closable opening is provided in the housing (38), offering access to the torque sensor (10).

10. The press device as claimed in any of the preceding claims, characterised in that there is a motor brake (6) disposed on the motor shaft (4), which is applied in the absence of current and is released when current is carried.

11. The press device as claimed in any of the preceding claims, characterised in that a sprung stop (76) is provided between the threaded nut (16) and the housing (22) for determining the zero position of the travel measuring device.

12. The press device as claimed in claim 11, characterised in that the stop is designed as a sprung ring (76) on the threaded nut (16).

13. The press device as claimed in any of the preceding claims, characterised in that the thread spindle (14) has a multiple-start, e.g. five-start, thread.

14. The press device as claimed in any of the preceding claims, characterised in that the threaded nut (16) is retained in an axially stepped support sleeve (18), which is guided in the housing (22) in a non-rotatable manner, and such that it can be axially displaced.

15. The press device as claimed in claim 14, characterised in that the support sleeve (18) is connected to, or forms, an inner sleeve of an axial guidance system with recirculating ball bearings (20), the outer sleeve (21) of which is connected to the housing (22) in a non-rotatable manner.

16. The press device as claimed in either of claims 14 or 15, characterised in that the support sleeve (18) has a cylindrical supporting part (18a) with a relatively large diameter and a sleeve (18b) with a smaller diameter bolted to it and forming the pressing ram.

17. The press device as claimed in any of the preceding claims, characterised in that the housing (22) has an outer cylindrical clamping surface (24) for fixing the press device in a freely selectable axial clamping position.

18. The press device as claimed in claim 17, characterised in that a double-cone set of clamps (28) is disposed on the clamping surface (24).